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Compensatory Health Beliefs, Food Preferences and Sedentary Behaviors in Patients with Diabetes Type II

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This study investigated the relationship between Compensatory Health Beliefs, Food Preferences and Sedentary behaviors in Patients with Diabetes Type II. It was hypothesized that there is will be a relationship between Compensatory Health Beliefs, Sedentary behavior and Food Preferences in Patients with Diabetes Type II. It was also hypothesized that Sedentary behaviors predict the influence of Compensatory health beliefs Food preferences in Patients with Diabetes Type 2. Correlational research design was used and the sample consist of 200 patients from which 30 patients were removed after data screening from Diabetic Units of Public sector hospitals of Lahore. Pearson Correlation analysis revealed that age, no. of children, work status and duration of diabetes was positively correlated Compensatory Health Belief. There was positive correlation among Gender, family system and weight with Food Preferences. The demographics variables i.e. Gender and Monthly Income were positively correlated with Sedentary behaviors. Marital status was positively correlated with the study variables. Age and height were negatively correlated with Compensatory Health Belief, Food Preferences and Sedentary Behavior. Independent Sample t- test, One-way Anova and Hierarchical regression were also employed to assess the mean differences and prediction of hypothesis. Hierarchical regression showed that there was no significant prediction among the variables. The findings of the research may lay ground for further research studies.

Keywords: Compensatory Health Beliefs, Food Preferences, Sedentary Behavior, Diabetes Type II.

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Diabetes mellitus, also referred to as diabetes, is a metabolic condition that raises blood sugar levels. Insulin is a hormone that transports sugar from the blood into cells where it can be stored or utilized as fuel. The fuel or energy that tissues and organs require to function effectively is provided by glucose (Shoiup, 2015). International Diabetes Federation (IDF) released fresh data highlighting the worrisome rise in diabetes prevalence around the world. In comparison to the 2017 results, 38 million more persons are now estimated to have diabetes worldwide. According to new statistics published today in the 9th Edition of the IDF Diabetes Atlas, Pakistan is currently among the top ten nations in terms of absolute increase in diabetes prevalence (IDF, 2019). To reduce the disease's impact, Pakistan's national health policy must incorporate diabetes prevention efforts (Meo et al., 2016).

The patient may realize the frequently silent feelings they are experiencing regarding having diabetes by working with a health therapist. Comparing those with and without diabetes, those with diabetes are 2-3 times more likely to be categorized as depressive. Diabetes care, with its required dietary adjustments and self-management duties, can negatively impact quality of life. Diabetes patients are more likely to experience dread and anxiety. Fear of hypoglycemia and fear of needles are two specific types of anxiety that can accompany diabetes, eating disorders and Sexual disorders such as erectile dysfunction in men. Compensatory Health Beliefs are beliefs that an unhealthy behavior (such as eating unhealthily) can be compensated for by a subsequent healthy behavior (such as eating healthily or being physically active). Following a healthy diet can be difficult, and only a few individuals

can successfully change their eating behavior in the long run (e.g. Wing & Phelan, 2005). It is assumed that individuals activate Compensatory Health Beliefs (Knäuper et al., 2004) to mitigate such unpleasant states and to justify indulgence (Rabiau et al., 2006). The evaluative opinions that people show concerning foods are referred to as food preferences. The qualitative assessment of foods as well as how much people like and dislike them are included in food preferences. Cultural differences are a significant factor in determining food preferences. Your blood glucose level must remain within the range that your medical team advises by paying attention to what you choose to eat, how much you eat, and when you eat (Krause, 2015). Physical exercise is not necessary for sedentary behaviour, which involves using little or no energy when awake. Long periods of time spent playing video games, reading, listening to music, watching TV, or using a computer are considered sedentary behaviour (Han et al., 2017).

Numerous studies indicate that lack of access to transportation, sidewalks, streetlights, and other environmental amenities hinder active living in all demographics, leading to subpar longterm mobility and a host of negative health effects (Beard et al., 2009; Owen et al., 2010; Botticello et al., 2015; Clarke & George, 2005).

Rationale

Food preferences of an individual are often related to culture, socioeconomic status, health status and beliefs. It based on the adherence of a specific food groups. The present is study is an attempt to investigate the relationship between Compensatory Health Beliefs, Food Preferences and Sedentary behavior in Patients with Diabetes type II. There is a great need of research on the role of Compensatory Health Beliefs, Food Preferences and Sedentary behavior in Patients with Diabetes type II. People with Diabetes are more likely to have serious complications when they do not have exercise and do not focus to their dietary habits. Findings of our research will facilitate us in examining whether there is a relationship between Compensatory Health Beliefs, Food Preferences and Sedentary behavior in Patients with Diabetes type 2 and further facilitate researchers to explore new horizon in their area for more investigation on these study variables.

Aim of the Study

To investigate the associations between demographic variables and Sedentary Behaviors, Compensatory Health Belief and Food Preferences in Patients with Diabetes type II.

Hypotheses

- Age, gender, education, family system, Family background (i.e. rural and urban), marital status, Social economic status (lower, middle, upper) will be correlated with Sedentary Behaviors, Compensatory Health Belief and Food Preferences in Patients with Diabetes type II.
- Age, gender, education, family system, Family background (i.e. rural and urban), marital status, Social economic status (lower, middle, upper) will predict Sedentary Behaviors, along with Compensatory Health Belief and Food Preferences in Patients with Diabetes type II.
- There will be demographics differences on Sedentary Behaviors, Compensatory Health Belief and Food Preferences in Patients with Diabetes type II.

Method

Research Design

A correlational research design was used in the present research.

Sample and Sampling Technique

In order to determine the appropriate sample size for the present research, power

analysis was undertaken through G-power calculator. The analyses revealed an estimated sample size of N 200. However, after missing values and outliers, a final sample of 170 was considered. Therefore, a sample of (N-170) was included in the present study. The sample was recruited from public sector hospitals. Non- probability purposive sampling technique was utilized in the present study. Diabetes type 1 and gestational diabetes were excluded.

Instruments

Demographic Information Sheet

The sheet included the following demographics i.e. age, gender, education, family system (nuclear, joint), Family background (i.e. rural and urban), marital status, Social economic status (lower, middle, upper) (Kamran, 2014).

Table 1

Descriptive Statistics of Demographic Variables

Variable	*N*
Gender	
Male	72
Female	98
Age (years)	
20–40	44
41–60	88
61–80	38
Education	
Primary	22
Middle	21
Matric	52
Intermediate	24
Bachelor's	30
Master's	21
Marital status	
Married	155
Unmarried	9
Divorced	1
Separated	3
Engaged	2
Duration of marriage (years)	
1–20	43
21–40	104
41–60	12
Age of partner (years)	
25–45	48
46–65	87
66–85	24
Work status	
Working	74
Non-working	96
Family system	
Joint	70
Nuclear	100

Clinical Information Sheet

It included information about clinical factors such as weight, height, blood sugar level, cholesterol level etc. (Kamran, 2014).

Table 2

Descriptive Statistics of Clinical Variables (N=170)

Variable	*n*	*%*
Age at onset (years)		
20–40	78	42.0
41–60	92	54.0
Cause of diabetes		
Bedridden	1	0.5
Hypertension	19	11.0
CKD (renal)	14	8.0
Inherited	17	10.0
Gestational diabetes	23	13.0
Liver-related	4	2.3
Obesity	16	9.4
Tension/anxiety	12	7.1
Stress	8	4.7
Unspecified cause	14	8.2
Weight (kg)		
45–60	50	29.0
61–85	86	50.5
81–105	31	18.0
101–135	1	0.5
Family history of diabetes		
Parents (both)	12	7.0
Father	67	39.4
Mother	23	14.0
Siblings	16	4.9
Grandparents (maternal)	5	2.9
Grandparents (paternal)	2	1.1
Husband	45	26.0

Sedentary Behavior Questionnaire SBQ (Rosenberg et al., 2010)

The Sedentary Behavior Questionnaire (SBQ) was adapted from a measure used in adults that has some evidence of reliability and validity. It was designed to assess the amount of time spent doing 9 behaviors that is watching television, playing computer/video games, sitting while listening to music, sitting and talking on the phone, doing paperwork or office work, sitting and reading, playing a musical instrument, doing arts and crafts, sitting and driving/riding in a car, bus, or train. The Likert scale range from None, 15 minutes or less, 30 minutes, 1 hour, 2 hours, 3 hours, 4 hours, 5 hours and 6 hours or more. The test-retest reliability is α=0.85 (Rosenberg et al., 2010).

Eating Specific Compensatory Health Beliefs (Wilde et al., 2013)

The eating specific CHB Scale assesses a participant's likelihood of engaging in Compensatory Health Belief. The scale consists of 10 items. Participants respond on a Likert scale ranging from 1 (never) to 5 (always). The published reliability for these scales is Cronbach's alpha of 0.80 (Wilde et al., 2013).

Food Preferences Questionnaire FPQ (Filde et al., 2014)

The food preference questionnaire requires participants to rate their liking of 62 individual foods on a 5-point Likert scale, ranging from "not at all" to "a lot". Participants are instructed to select 'not applicable' if they are not familiar with, or have no memory of having tried a food item. The reliability of the scale varies from 0.62 to 0.8 (Filde et al., 2014).

Procedure

The required formalities for the study approval were done. Permissions from diabetic Units of Public sector hospitals were sought and after permissions, participants were approached. The standard protocol for participants recruitment in the research was followed that is Participant Information Sheet and consent form upon their agreement. Compensatory Health Beliefs Scale, Food preferences Questionnaire and Sedentary Behavior Questionnaire were translated into Urdu language by MAPPI guidelines. After that the questionnaires were administered. Participants were ensured about their confidentiality of the information they provided. Moreover, they were given the choice to withdraw. Data Collection was followed by the statistical analysis of the raw data. Reliability of the assessment measures was assessed by calculating the Cronbach's Alpha value of each construct. Pearson Moment Correlation Analysis, Independent Sample t- test, One-way Anova and Hierarchical Multiple Regression was employed to assess the prediction hypothesis. SPSS version 21.0 was used to carry out all analysis.

Ethical Considerations

Prior permission was taken from the authors of the scales through emails and the heads of department of hospitals. Consent was taken from each participant and the nature of the study was explained to participants. The participants had right to quit from participation and terminate at any time they wish to.

Results

To find out the relationship Pearson Product Moment correlation was applied. The results of Pearson Product Moment correlation are shown in table. The correlation between the Compensatory health Beliefs, Food Preferences and Sedentary behavior with the covariates determining in Patients of Diabetes Type II that was carried out through Pearson Product Moment Correlation.

Table 3

Pearson Product Moment Correlation between Variables (N=170)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.Gender	-	-.23**	.149	-.120	-.007	.057	.076	.157*	.105	-.138	-.274**	-.046	-340**	.125	-.020	-.058	-.083	-.132	.035
2.Age	-	-	-.20**	.748**	.586**	.613**	.042	.117	.284	.031	.056	-.072	.450**	.368**	.124	.029	.001	-.056	-.079
3.Marital status	-	-	-	-.178*	-.250**	-.265**	-.093	-.240**	.143	-.031	-.082	.125	-.099	-.026	-.020	-.273**	.019	.007	.022
4.Duration of marriage	-	-	-	-	.528**	.533**	.223**	.169*	.202**	.066	.030	-.115	.416**	.405**	.002	.051	.048	-.051	-.089
5.Age of partner	-	-	-	-	-	-	-.234**	.248**	.099	.121	.014	.110	.305**	.315**	-.005	.207**	-.113	-.064	-.004
Work status	-	-	-	-	-	-	-	-.094	.222**	-.090	-.128	-.187*	-.090	.052	-.155*	-.096	.074	-.019	-.028
6.No. of siblings	-	-	-	-	-	-	-	-	-.014	-.114	.021	-.184*	.122	-.053	.042	.003	-.088	.012	-.007
7.Monthly income	-	-	-	-	-	-	-	-	-	-	.459**	.316**	.196*	-.019	-.141	.204**	.019	.017	.081
8.Age at onset of 9.Diabetes	-	-	-	-	-	-	-	-	-	-	-	-	-.020	-.065	-.270**	.152*	-.035	-.035	.022
10.Duration of diabetes	-	-	-	-	-	-	-	-	-	-	-	-	-	-.088	.124	.172*	.050	-.138	-.024
11.HbA1c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-.095	.090	-.029	.039	.020

12.Weight	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.020	.164*	.041	.024
13.Height	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.078	-.001	.125
14.Family 15.History of diabetes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.129	-.010	.104
16.Medication Adherence	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-.161*	-.114	-.189
17.Compensatory Health Beliefs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-.003	.094	-.140
18.Food preferences	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.101	.037
19.Sedentary Behaviors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-.118

Note: *p < .05; **p < .01; ***p < .001.

It is revealed that age, number of children, work status whether working or not, duration of diabetes were positively correlated with Compensatory Health Belief while Gender, Age, Family system, weight and HbA1c was positively correlated with Food Preferences. Moreover, gender and Monthly Income were positive correlated with Sedentary Behaviors. Marital status was positively correlated with all the study variables. Whereas, other covariates such age of partner, height and medication adherence were negatively correlated with the all of the study variables such as Compensatory Health Belief, Food Preferences and Sedentary Behaviors.

Table 4

Hierarchal Multiple Regression Analysis for Study variables.

Step	Predictor	*B*	*SE*	*β*	R^2	ΔR^2
1	CHB	0.27	0.30	0.07	0.05	0.05
	FPQ	0.24	0.14	-0.13		
2	Age	0.29	0.91	-1.91	0.07	0.02
	Marital Status	1.32	0.03	0.03		
	No. of Siblings	0.30	1.20	0.11		
	Monthly Income	-1.82	0.00	-0.05		
	HbA1c Test	1.11	3.14	0.02		
	Family History of Diabetes	-0.67	4.7	-0.11		
	Any Other Physical Condition	-0.25	4.5	0.04		

Note. *p < .05, **p < .01, ***p < .001

It was hypothesized that Sedentary Behavior predicts the relation between Compensatory Behavior and Food preferences. To analyze this hierarchical regression was done. Table 4 presents the results of multiple hierarchical regressions for study variables. The overall model explained 27 % variance F (2,156) = .16, p= <.001. It showed in the analysis that there was non-significant prediction of variables.

Table 5

Independent Sample t-test for Mean Differences of Male and Female on study variables (N=170)

Variable	Male (n = 72)	Female (n = 98)	*t*	*p*	Cohen's d
	M (SD)	*M (SD)*			
Compensatory Health Beliefs	33.50 (6.22)	32.32 (7.52)	1.08	.03	0.17
Food Preferences	235.26 (19.89)	228.20 (29.85)	1.72	.04	0.27
Sedentary Behaviors	40.02 (14.60)	41.08 (15.15)	-0.45	.74	—

Note. CI= confidence interval; LL: lower limit; UL= upper limit M = mean; SD = standard deviation.

Independent t-test was employed to assess the mean differences of the two groups. Table 5 showed result of independent sample t-test which indicated that there was a significant mean difference between Compensatory Health Beliefs and Food Preferences of Gender that is male and female. The mean difference of Sedentary behavior is non-significant with Gender. Moreover, Males show more preference to all food groups ($M = 235.09$, $SD = 19.89$). The mean difference was statistically significant as t (170) = -.45, $p > .05$, $d = 0.07$.

Table 6

Independent Sample t-test for Mean Differences of Work Status on study variables (N=170)

Variable	Working (n = 72)	Non-Working (n = 94)	*t*	*p*
	M (SD)	*M (SD)*		
Compensatory Health Beliefs	32.40 (7.25)	32.98 (6.53)	0.50	.75
Food Preferences	233.26 (28.83)	228.80 (28.29)	1.20	.79
Sedentary Behaviors	41.36 (16.70)	39.78 (13.53)	0.78	.19

Note. CI= confidence interval; LL: lower limit; UL= upper limit M = mean; SD = standard deviation.

The result of independent sample t-test which indicated that there was a no significant mean differences between Compensatory Health Beliefs, Food Preferences and Sedentary Behaviors.

Table 7

Independent Sample t-test for Mean Differences of Family system on study variables (N=170)

Variable	Joint (n = 70)	Nuclear (n = 100)	*t*	*P*
	M (SD)	*M (SD)*		
Compensatory Health Beliefs	31.98 (6.64)	33.41 (7.22)	-1.30	.20
Food Preferences	230.60 (23.70)	231.60 (28.03)	-0.25	.98
Sedentary Behaviors	42.97 (14.23)	39.00 (15.18)	1.70	.74

Note: CI= confidence interval; LL: lower limit; UL= upper limit M = mean; SD = standard deviation.

The result of independent sample t-test which indicated that there was a no significant mean difference between Compensatory Health Beliefs, Food Preferences and Sedentary Behaviors.

Discussion

The study aimed to investigate the associations of study variables which were Compensatory Health Beliefs, Food Preferences and Sedentary behaviors with demographic variables (Age, gender, education, family system, family background (i.e. rural and urban), marital status, Social economic status (lower, middle, upper) in Patients with Diabetes Type II. The study showed a positive relationship with age, no. of children, work status and duration of diabetes. Moreover, it showed positive relationship between family system, weight and HbA1c test with Food Preferences. In order to test the research question, a hierarchical regression was conducted. The results showed that the utility of the predictive model was non-significant, $F(2,156) = .16$, $p < .0001$. The model explained a large amount of the variance between the variables (27%).

In a previous study, Parry (2013) it was reported that people who had more office time has been found to be independently associated with obesity and more incidence of Diabetes Type II. So, we can say that people who are more engaged in office work or work that includes physical inactivity are more at risk of getting Diabetes Type II.

The study variable marital status was significantly positively correlated with Compensatory Health Beliefs, Food preferences and Sedentary behavior which means that the study variables had positive relationship with marital status. It was suggested in a study that mother and married couples are more likely to be engaged in Sedentary behaviors as compared to the unmarried ones because they might be involved in child feeding, households, work from home, baby sitting and watching TV while eating meals (Lindsay, 2016). The number of hours per day spent watching TV or using a computer was positively correlated with weight (Lindsay et al, 2013) which means that weight increase as number of hours and watching TV time increases.

The descriptive analysis of the present study showed significant results through descriptive statistics. The patient with diabetes type II who had age at onset of diabetes ranging from 40-60 years are more likely to have Diabetes Type II (M=39.10). The cause of Diabetes Type II revealed to be more prevalent in patients who had CKD (Chronic Kidney Disease) (M=14.11), Hypertension (M=11.23) and Inheritance or Genetically (M=9.34) mostly. A recent study, Murata (2021) in Japan reported a High cholesterol, renal issues, high lipoprotein, increased BMI, and high systolic pressure are all significant risk factors for Diabetes Type II. Obesity on the other hand, is also the leading cause of Diabetes Type II as reported in a study that Obesity and diabetes are closely related to each other as about 80% diabetics are obese (Parmar, 2018).

In a previous study it was suggested that Individuals having a family history of diabetes exhibited a nearly twofold increase in type 2 diabetes prevalence compared to those without a family history of the disease (Cederberg et al, 2014). Consequently, the present study also revealed that people who had a family history of Diabetes are more likely to have Diabetes as compared to them who did not have family history. Specially, people whose fathers (M=39.4) had Diabetes are more at risk of getting Diabetes type II.

In a recent study it was reported dietary knowledge, education level, occupation, monthly income, and dietary practices were significantly related to patients' dietary practices and nutritional status (Wahome et al., 2018) which reflects the results of the present study in which education, work status and monthly income are associated with food preferences that are the food choices of people. Age, family history, poor socioeconomic position, obesity, and certain unhealthy lifestyle practices were found as sociodemographic factors associated with increased diabetes Type II risk (Mavrogianni, 2020).

Conclusion

Diabetes is one of the most prevalent diseases worldwide, associations with sociodemographic factors among patients with diabetes The prevalence of diabetes in Pakistan is 9.8%, with the disease affecting males and females nearly equally (10% and 9.7%, respectively). Pakistan, which has the seventh highest prevalence of diabetes worldwide, is expected to experience further rises in the disease with advancing urbanization and are associated factors of unhealthy lifestyle, genetic predisposition reduced physical activity, obesity, and increased caloric intake (Bhatti et.al; 2018). The present study also concluded the demographic and clinical/medical factors associating with Diabetes Type II with effect of Compensatory Health Beliefs, Food Preferences and Sedentary Behaviors. The present study explored that age, no, of children, work status and duration of diabetes was positively correlated with Compensatory Health Belief. There were positive correlations of gender, family system and weight with food preferences. The demographics variables i.e. gender and monthly income

were positively correlated with sedentary behaviors. Marital status was positively correlated with the study variables. Age and height were negatively correlated with Compensatory Health Belief, Food Preferences and Sedentary Behavior.

Limitations

The present study had some limitations that should be taken into considerations. The very first limitation of this study was that the present study is conducted by a beginner or amateur so there are chances of technical faults/ drawbacks in designing and conducting the research.

The second limitation of the research was that the sample was not representative as due to the shortage of time it was not possible to recruit from other hospitals such as the private sector hospitals. There is a probability that the present situation (inflation) might had influenced the response across the study constructs such as Food Preferences.

Implications

Diabetes continues to be a major contemporary epidemic. When it comes to the chronic condition, people generally are familiar with clinical aspects for the condition and ignore the psychological and demographic characteristics of living with a lifelong condition.

Findings of the present research revealed that role of demographic variables and clinical factors such as Weight gain, HbA1c test, physical inactivity, spending more time on TV or mobile phone and computers.

People generally focus on their medical points such blood glucose level, cholesterol levels etc., but do not focus on the physical and mental health that will improve consequently their quality of life by engaging in healthy lifestyle, healthy food choices and preferences and exercises.

References

Adriaanse, M. A., Vinkers, C. D., de Ridder, D. T. D., Hox, J. J., & de Wit, J. B. F. (2011). Do implementation intentions help to eat a healthy diet? A systematic review and meta-analysis of the empirical evidence. *Appetite, 56*(1), 183–193. https://doi.org/10.1016/j.appet.2010.10.012

Amrein, M. A., Rackow, P., Inauen, J., Radtke, T., & Scholz, U. (2017). The role of compensatory health beliefs in eating behavior change: A mixed-method study. *Appetite, 116*, 1–10. https://doi.org/10.1016/j.appet.2017.04.016

Bauman, A., Bull, F., Chey, T., Craig, C. L., Ainsworth, B. E., Sallis, J. F., & IPS Group. (2009). The International Prevalence Study on Physical Activity: Results from 20 countries. *International Journal of Behavioral Nutrition and Physical Activity, 6*, 21. https://doi.org/10.1186/1479-5868-6-21

Bennie, J. A., Pedisic, Z., Timperio, A., Crawford, D., Dunstan, D., & Bauman, A. (2015). Total and domain-specific sitting time among employees in desk-based work settings in Australia. *Australian and New Zealand Journal of Public Health, 39*(3), 237–242. https://doi.org/10.1111/1753-6405.12293

Bloom, D. E., Cafiero, E. T., Jané-Llopis, E., Abrahams-Gessel, S., Bloom, L. R., Fathima, S., Feigl, A. B., Gaziano, T., Mowafi, M., Pandya, A., Prettner, K., Rosenberg, L., Seligman, B., Stein, A. Z., & Weinstein, C. (2011). *The global economic burden of noncommunicable diseases*. World Economic Forum.

Britannica, T. Editors of Encyclopaedia. (2022, April 25). *Diabetes mellitus*. Encyclopedia Britannica. https://www.britannica.com/science/diabetes-mellitus

Castro, O., Bennie, J., Vergeer, I., Bosselut, G., & Biddle, S. J. H. (2018). Correlates of sedentary behaviour in university students: A systematic review. *Preventive Medicine, 116*, 194–202. https://doi.org/10.1016/j.ypmed.2018.09.016

Chang, P. C., Li, T. C., Wu, M. T., Liu, C. S., Li, C. I., Chen, C. C., Lin, W. Y., & Lin, C. C. (2008). Association between television viewing and the risk of metabolic syndrome in a community-based population. *BMC Public Health, 8*, 193. https://doi.org/10.1186/1471-2458-8-193

Chau, J. Y., Grunseit, A. C., Chey, T., Stamatakis, E., Brown, W. J., Matthews, C. E., & Bauman, A. E. (2013). Daily sitting time and all-cause mortality: A meta-analysis. *PLOS ONE, 8*(11), e80000. https://doi.org/10.1371/journal.pone.0080000

Berli, C., Loretini, P., Radtke, T., Hornung, R., & Scholz, U. (2014). Predicting physical activity in adolescents: The role of compensatory health beliefs within the Health Action Process Approach. *Psychology & Health, 29*(4), 458–474. https://doi.org/10.1080/08870446.2013.865028

Forestier, C., Sarrazin, P., Sniehotta, F., Allenet, B., Heuzé, J. P., Gauchet, A., & Chalabaev, A. (2020). Do compensatory health beliefs predict behavioural intention in a multiple health behaviour change context? Evidence in individuals with cardiovascular diseases. *Psychology, Health & Medicine, 25*(5), 593–600. https://doi.org/10.1080/13548506.2019.1653476

de Vries, H., Eggers, S. M., Lechner, L., van Osch, L., & van Stralen, M. M. (2014). Predicting fruit consumption: The role of habits, previous behavior, and mediation effects. *BMC Public Health, 14*(1), 1–11. https://doi.org/10.1186/1471-2458-14-730

Delfino, L. D., Tebar, W. R., Gil, F. C., et al. (2020). Association of sedentary behaviour patterns with dietary and lifestyle habits among public school teachers: A cross-sectional study. *BMJ Open, 10*, e034322. https://doi.org/10.1136/bmjopen-2019-034322

Denys, K., Denys, P., Macander, M., & Zboralski, K. (2015). Quality of life, acceptance of illness, and sense of health control in patients with chronic musculoskeletal disorders during the rehabilitation process. *Polish Journal of Physiotherapy, 15*(2), 155–158.

Eric Bomberg, M., Neuhaus, J., Hake, M. M., Engelhard, E. M., & Seligman, H. K. (2019). Food preferences and coping strategies among diabetic and nondiabetic households served by U.S. food pantries. *Journal of Hunger & Environmental Nutrition, 14*(1–2), 4–17. https://doi.org/10.1080/19320248.2018.1512926

Fatima, S. K., Akhtar, A., Khan, A. R., & Fatima, S. S. (2019). Distribution and determinants of sedentary lifestyle among health care professionals. *Pakistan Journal of Medicine and Dentistry, 8*(2), 7.

Fisher-Hoch, S. P., Rentfro, A. R., Salinas, J. J., Pérez, A., Brown, H. S., Reininger, B. M., & McCormick, J. B. (2010). Socioeconomic status and prevalence of obesity and diabetes in a Mexican American community. *Preventing Chronic Disease, 7*(3), A53.

Fisher-Hoch, S. P., Vatcheva, K. P., Laing, S. T., Hossain, M. M., Rahbar, M. H., Hanis, C. L., & McCormick, J. B. (2012). Missed opportunities for diagnosis and treatment of diabetes, hypertension, and hypercholesterolemia. *Preventing Chronic Disease, 9*, 110298.

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among U.S. adults, 1999–2008. *JAMA, 303*(3), 235–241. https://doi.org/10.1001/jama.2009.2014

Jimmy, B., & Jose, J. (2011). Patient medication adherence: Measures in daily practice. *Oman Medical Journal, 26*(3), 155–159. https://doi.org/10.5001/omj.2011.38

Mohammed, A. S., Adem, F., Tadiwos, Y., Woldekidan, N. A., & Degu, A. (2020). Level of adherence to dietary recommendations and glycemic control among patients with type 2 diabetes mellitus. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 13*, 2605–2612. https://doi.org/10.2147/DMSO.S256738

Prueksaritanond, S., Tubtimtes, S., Asavanich, K., & Tiewtranon, V. (2004). Type 2 diabetic patient-centered care. *Journal of the Medical Association of Thailand, 87*(4), 345–352.

Tareen, R. S., & Tareen, K. (2017). Psychosocial aspects of diabetes management: Dilemma of diabetes distress. *Translational Pediatrics, 6*(4), 383–396. https://doi.org/10.21037/tp.2017.10.04

Winston, A. P. (2020). Eating disorders and diabetes. *Current Diabetes Reports, 20*(8), 32. https://doi.org/10.1007/s11892-020-01320-0

Zanoveli, J. M., Morais, H., Dias, I., Schreiber, A., Pasquini de Souza, C., & Cunha, J. (2015). Depression associated with diabetes: From pathophysiology to treatment. *Current Diabetes Reviews, 12*(3). https://doi.org/10.2174/1573399811666150515125349